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LISTING Newsletter

Newsletter of the
Long Island Sinclair\Timex
Users Group
.....

Incorporating NYTSE

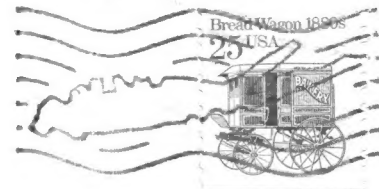
November 1988

Next Meeting December 18 2⁰⁰PM
Harvey Rait's House

Happy Thanksgiving



L.I.S.T.
5 Peri Lane
Valley Stream, NY 11581



TO:

Don Lambert Jan/88
3310 Clover Dr. S
Cedar Rapids, IA
52404



FIRST CLASS MAIL
DATE MEETING NOTICE
Please DON'T delay!

LISTING
Please send submissions to:
LIST
Mr. Harvey Rait
5 Pari Lane
Valley Stream, N.Y. 11581

COMING EVENTS:

December 18, 1988 LIST Meeting
December 19, 1988 NYTSE Meeting

MEETING MINUTES
November 18, 1988

In future issues of LISTING,
your DUES DUEdate will be
printed on the upper right hand
corner of the address label.
Please send in your dues before
this date to retain your
membership in LIST.
This is your Timex/Sinclair
Users Group. It provides you
with help and assistance when
you need it. It publishes this
newsletter, and program tapes.
Your dues are needed to continue
providing these services now
and in the future.
So don't be delinquent when the
dues are due.

Harvey informed us that a copy
of LISTING, which was sent to
Marty Healthgard was returned
stamped DECEASED. An attempt to
contact Marty's family is being
made, hopefully to find out that
the postal service used the
wrong stamp.

Tom Skapinski advised us that
LISTING will no longer be sent
to user groups who do not
send there newsletter to us in
reciprication.

Fred Stern (your editor) is
requesting to borrow back issues
of SYNC MAGAZINE from any member
willing to lend them. (Volume 1,
Number 1 thru Volume 3, Number 1)
These borrowed issues will be
photocopied for the LIST library
for reference by current and
future members.

LIST members have the privilege
to borrow books, back
newsletters and reference
material from the LIST LIBRARY.
See Tom Skapinski before or
after the monthly LIST meeting.

Brooklyn Closeout Corp. has
confirmed that they still have
TS2068 for sale. Bargain with
them to get the best price.

LIST will be selling microdrive
cartridges at meetings or by
mail for \$2.00 each.
These are without write protect
tabs.

Other topics of discussion:
Spectra microdrive usable in QL.
LIST meetings to be announced
in newspapers, pennysaver.
October LISTING article about
sources for the SOLD used in
the TS2068
Bob Gilder's project
Installing a QL in an PC case.
Timex/Sinclair hardware and
software world wide marketing
strategie as seen by fellow
members.

SPOTLIGHT ON MEMBERS

Raymond Kaufman - A new member
who we welcome to the meeting.

CLASSIFIEDS

This Classified Section is
available to all LISTING
subscribers, FREE of charge.
The only restriction is that it
is to be used only for the
seeking, selling or swapping
of Sinclair, Timex or Microace
computer equipment, peripherals
and software.

Mike Fink is selling a brandnew
GEMINI 10X printer, and is
seeking a COBOL-COMPIER for
the 2068.

dgar Gross is seeking a disc s
ystem for the 2068.

To place or answer a classified

LISTING
FRED STERN
214 ROBERTS ST.
HOLBROOK, N.Y. 11741

A Final Word

My name is Fred Stern, and I
am the editor of this edition
of LISTING. I would like to
thank Mr. Steve Kage for
another excellent job as
reporter.
During this Thanksgiving Holiday
as a Timex/Sinclair user and to
quote COMPUTER SHOPPER
(survivor), I reflect on how
LUCKY we at LIST are.
We are truly fortunate to have
some of the finest hardware and
software specialists within our
organization.
Our members are always testing,
scrutinizing, building or
evaluating new hardware and
software and most important of
all, sharing their coments and
criticisms with the rest of us.
LIST's membership has fallen
slightly, but new members are
joining monthly.
We should all be thankful for
a good year, but start planning
so that the next will be better.

Have a Happy Thanksgiving

DATA COMPRESSION FOR THE 2068 and OTHER STUFF
c 09/88 George Gilder Assoc. Inc.

I have been experimenting with data compression for the past few years. This system allows shorter data statements and has faster data entry as well.

Allow me to give you a few examples:

1 I have developed a telephone book / dialing system. The numbers are entered as A\$ strings. In New York City, we have to dial a 1 before each area code. My telephone number is 1718 - 544-1106, 11 digits in length. I have dimensioned 250 names and numbers.

I have designed the system to use only 8 digits. 718 stands for Queens. I enter that number as Q5441106. 516 is the area code for Long Island. That suffix is "L". "F" is Florida, "J" for New jersey, "X" for 1800, etc.

Before the number is processed, it is sent through a small routine ie; IF A\$(i,1)="L" THEN LET A\$="1516"+a\$(2). It not only saves bytes (3*2*250=1500),but allows rapid entry as well.

2 I use a mail merge client mailing program. There are data strings that uses 500 names and addresses. The files are 108 charactors long, written for the toy industry. In that industry at least half the potential customers are at 200 Fifth Avenue, or at 1107 Broadway. The files, as seen in the Write a Record routine are written with a series of prompts. Let us examine the routine:

f= the file number. line 5200 dimensions each part of every file. I have used the following variables: k=10, h=2,j=1. The total number = 108.

The code is a one letter prefix to identify the files by areas of each companies' expertise, ie, Dolls, Games, etc. When the input for president's name you have two choices. Type in the actual name if known or enter P. If you chose the latter, line 5300 writes "Atten: president".

When the Address prompt appears, enter T (for toy) and line 5500 assigns the 200 Fifth address complete to zip code. Enter B (Broadway) and line 5510 writes the rest. The subroutine at 900 sorts each data line into a recognizable format.

Athough each of these examples took lots of time to develop, The ultimate saving in computer entry time is fantastic. Perhaps you can come up with your examples.

I can answer any questions by SSAE only. George Gilder 67-38 108th Street Forest Hills, NY 11375.

```

5000>REM *****
5005 REM *   Write a record   *
5010 REM *****
5020 INPUT f
5050 IF f=0 THEN GO TO 1
5150 IF f>500 OR f<0 THEN GO TO
VAL "5150"
5200 CLS : DIM k$(1): DIM n$(k+k
): DIM m$(32): DIM A$(k+k): DIM
b$(K*H): DIM z$(VAL "7"): DIM
P$(8)
5220 INPUT "Code: ";k$: IF k$="0
" THEN GO TO 1
5250 INPUT "Pres. Name: ";n$
5270 IF n$(j)="0" THEN GO TO 1
5300 IF n$="P"+x$ THEN LET n$="
Att: President"
5400 INPUT "Co. Name : ";m$
5450 INPUT "Address : ";a$
5500 IF a$(j)="T" AND a$(H TO )=
x$ THEN LET a$="200 Fifth Av
enue": LET b$="New York,N.Y. ":
LET z$="10010": GO TO 5700
5510 IF a$(j)="B" AND a$(H TO )=
x$ THEN LET a$="1107 Broadwa
y": LET b$="New York,N.Y. ": LE
T z$="10010": GO TO 5700
5550 INPUT "City,State: ";b$
5650 INPUT "Zip: ";z$
5700 INPUT "Phone :";p$
5800 LET aa=0: LET y$=k$+n$+m$+a
$+b$+z$+p$: LET s$(f)=y$: GO SU
B 900
5900 PRINT f': GO SUB 8000: GO T
O 5000

```

8K ROM
16K RAM

A Personal Money Management Program

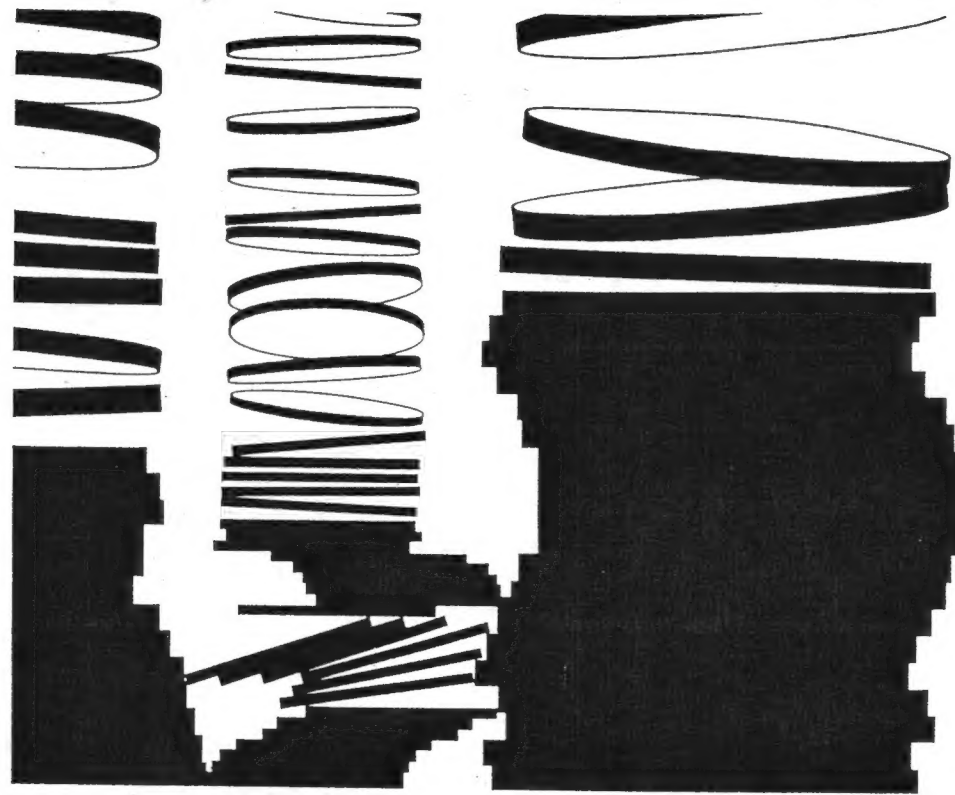
Alan Pattison

Where do we stand financially? This is one of the questions of greatest concern in the home office. We make our deposits, write our checks, and pay our bills, but these activities do not provide the information we need to interpret our position. We need to know not only our income and outgo, but also where our money is and what it is doing. We need to know not only this year, but also last year and other years. The program below is one that I developed to provide answers to such questions for my own situation. You may not have the same needs or questions, but perhaps the program will enable you to pose the questions you want to your computer and find the answers you need.

When the program has been activated, simply enter income, expense, and loan principal items each month. The computer will then provide you with:

- 1) An income statement for the current month and the year-to-date.
- 2) An expense statement for the current month and the year-to-date.
- 3) A balance sheet showing your various assets, liabilities, and net worth.
- 4) A cash flow statement for the month and the year-to-date.
- 5) A comparison of expenses to date with your yearly budget.
- 6) A month by month graph comparing income with expenses.
- 7) Another month by month graph comparing each month's expenses this year with those of last year.
- 8) A listing showing month by month income and expenses as well as your average monthly income and expenses.

You can make as many entries as necessary for any item—right out of your check book, Visa or Master Charge records, etc. Your checking account balance and all other assets and liabilities will appear correctly on your



balance sheet. There is also a provision for entering transfers of funds between accounts.

The program works best with your computer in FAST mode.

To use the program, each month simply enter your income and expenses—typing in the name of the item and the amount of the transaction. The computer will ask which account the money is for or from, which you enter by code "X," "S," etc.

The computer will add together similar items and adjust your assets and liabilities page, your income and expense totals, your cash flow, and your graphs.

If you have outstanding loans such as a mortgage, be sure to enter your principal payments under menu item #10. Your interest on the loans should be entered on the expense statement.

The program also allows you to enter transfers of funds between different accounts under menu item #10.

Instructions for Activating the Program

1) After loading "Money Manager" in your ZX81, save the program on tape just as it is in case you mess up the rest of the instructions.

2) GOTO 5 and enter menu item #1. Enter an income account name, e.g. "SALARY," enter a zero, then enter another zero. Your screen will print the account name, followed by "0" under Month and "0" under year. Continue entering account names, followed by the two zeros until you have entered six. (Note: If you want more or less than six categories, change the DIM statements in this section as well as the FOR/NEXT loops).

3) Enter "2" and return to menu. Press "2" and you will be on the expense sheet. Here, you must type in each expense account name, followed by "0," "0," just as you did with income. The program is set up for 17 expense items, so, if you want more or less, you will need to change the DIM statements and

FOR/NEXT loops in this expense section. With 17 expense items, your screen will display a Code 5 at the bottom—press "C" and ENTER to continue.

4) Enter "2" and return to menu. Exit the program by entering menu item 12.

5) Delete all the following statements in your listing (simply type each number and ENTER, one by one.)

235, 236, 238, 239, 241, 242, 255, 260, 265, 519, 522, 523, 524, 525, 526, 527, 528, 531, 532, 533.

6) Type GOTO 1700 and ENTER. Your screen will show a report code 2. Now type GOTO 2500 and ENTER. Your graph format will appear on the screen.

7) Type GOTO 3600 and ENTER. Again your screen will show a report code 2. Type GOTO 4500 and ENTER. Your income/expense graph format will appear on the screen.

8) Delete the following statements in your listing by typing and ENTERING each number individually.
1700, 1720, 1740, 3600, 3610, 3620.

9) For the 2-Year expense comparison graph, you must enter each of last year's monthly expenses. (If you do not do this, this graph should be ignored.) Type in the following:

LET R(1)=(January last year expenses)

LET R(3)=(February last year expenses)

LET R(5)=(March last year expenses)

Continue with LET R statements 7, 9, 11, 13, 15, 17, 19, 21, 23 for the remaining months of last year. (Note that these are all odd numbers—even numbers are reserved for the current year.)

Last year's expense entries will be held in reserve and will not appear on the graph until the corresponding months this year are entered. (Except, the graph will show each succeeding month's expenses for last year as well as those through the current months.)

10) Type GOTO 5 and ENTER. Type menu item #8 and your budget page will be on the screen. As each budget expense item appears, type in and ENTER your budgeted amount for that item. When the screen shows a report code 5 at the bottom, press "C" for the next page.

11) Delete listing statements 3100, 3105, 3120, and 3135.

12) You must now load the computer with additional data in order to make your program work right. This is done with LET statements,

entered one by one (numbering not necessary). The titles may be changed to fit your own situation. Type in as follows:

a) Load your Assets:
 LET X=(Checking account balance)
 LET V=(Visa or other cash card balance)
 LET S=(Savings account)
 LET C=(Cash on hand)
 LET CD=(Certificates of deposit)
 LET ST=(Stocks and bonds)
 LET PR=(Real and personal property)
 LET MA=(Other assets)

b) Load your Liabilities:

LET MG=(Mortgage principal balance)
 LET L=(Other loan balance)

13) Type GOTO 5 and ENTER. Your program is now set up for you to use. If you are starting the program in the middle of the year, enter income and expense items month by month for all prior months. This is important if your graphs are to work correctly. If you do make entries for prior months, your balance sheet will no longer be correct. Therefore you should go back to instruction #12 and reload your Assets and Liabilities.

Listing 1.

```

2 REM ***** DESIGNED BY
3 ALAN PARTISON, OLYMPIA, WA
4 REM "MONEY MANAGER"
5 REM MA=MISC. ASSETS, X=CHECK
6 ING, V=VISA, S=SAVINGS, C=CASH, CD=C
7 CERT. OF DEP., ST=STOCKS, MG=MORTGA
8 GE, L=INS. LOAN
9 LET S$=""
10
11 CLS
12 SLOW
13 PRINT
14 LET T$=""
15
16 PRINT S$
17 PRINT TAB 9; "MONEY MANAGER"
18 PRINT T$
19
20 PRINT
21 LET F$=""
22
23 PRINT "DO YOU WANT TO:"
24 PRINT
25 PRINT TAB 1; "(1) CHECK INCOME
26 STATEMENT?"
27
28 PRINT TAB 1; "(2) CHECK EXPENS
29 E STATEMENT?"
30
31 PRINT TAB 1; "(3) CHECK ASSETS
32 AND LIABILITIES?"
33
34 PRINT TAB 1; "(4) ENTER INCOME
35 ITEMS?"
36
37 PRINT TAB 1; "(5) ENTER EXPENS
38 E ITEMS?"
39
40 PRINT TAB 1; "(6) SEE INCOME/E
41 XPENSE GRAPH?"
42
43 PRINT TAB 1; "(7) SEE 2-YEAR E
44 XPENSES GRAPH?"
45
46 PRINT TAB 1; "(8) COMPARE EXPE
47 NSES WITH BUDGET?"
48
49 PRINT TAB 1; "(9) SEE CASH FLO
50 W STATEMENT?"
51
52 PRINT "(10) TRANSFER FUNDS; R
53 EADY LOANS?"
54
55 PRINT "(11) SEE MONTHLY INCOM
56 E/EXPENSE?"
57
58 PRINT "(12) EXIT PROGRAM?"
59
60 PRINT "ENTER YOUR CHOICE. 1
61 TO 12."
62
63 INPUT Q
64 CLS
65
66 IF Q=1 THEN GOTO 200
67 IF Q=2 THEN GOTO 500
68 IF Q=3 THEN GOTO 800
69 IF Q=4 THEN GOTO 300
70 IF Q=5 THEN GOTO 500
71 IF Q=6 THEN GOTO 4000
72 IF Q=7 THEN GOTO 2000
73 IF Q=8 THEN GOTO 3000
74 IF Q=9 THEN GOTO 6000
75 IF Q=10 THEN GOTO 6500
76 IF Q=11 THEN GOTO 7500
77 IF Q=12 THEN GOTO 10000
78
79 REM *INCOME STATEMENT*
80 REM AFTER ENTERING CATEGORI
81 ES, DELETE 235, 236, 238, 239, 241, 2
82 45, 255, 260, 255
83
84 PRINT TAB 12; "INCOME"
85 PRINT TAB 12; "INCOME"
86 PRINT TAB 12; "INCOME"
87 PRINT T$
88 DIM H$(6, 15)
89 DIM F$(6)
90 LET H$="MONTH"

```

```

40 PRINT "ITEM"; TAB 16; H$; TAB
41 "YEAR"
42 LET HT=0
43 LET FT=0
44 PRINT S$
45 FOR B=1 TO 6
46 INPUT L$(B)
47 INPUT H$(B)
48 INPUT F$(B)
49 PRINT L$(B); TAB 16; H$(B); TAB
50 F$(B)
51 NEXT B
52 PRINT F$
53 PRINT "TOTAL"; TAB 16; HT; TAB
54 FT
55 PRINT T$
56 PRINT "TYPE ""1"" TO MAKE E
57 NTRIES, ""2"" TO RETURN TO 5
58 T"
59 INPUT U
60 CLS
61 IF U=2 THEN GOTO 5
62 REM *INCOME ENTRIES*
63 PRINT "IS THIS A NEW MONTH?"
64
65 INPUT K$
66 IF K$="NO" THEN GOTO 374
67 FOR Z=1 TO 6 STEP 1
68 LET HT=0
69 LET B=Z
70 LET H$(B)=0
71 NEXT Z
72 PRINT "TYPE MONTH-3 LETTER
73 ABBREVIATION"
74 INPUT M$
75 CLS
76 PRINT TAB 8; "INCOME ENTRIES"
77
78 PRINT S$
79 PRINT "TO END ENTRIES TYPE
80 RETURN"
81 PRINT T$
82 PRINT TAB 16; H$; TAB 25; "YEA
83 R"
84
85 PRINT S$
86 PRINT "ITEM:"
87 INPUT P$
88 IF P$="RETURN" THEN GOTO 5
89 LET A=LEN P$
90 DIM R$(6, A)
91 FOR B=1 TO 6
92 LET R$(B)=L$(B)
93 IF P$=R$(B) THEN GOTO 452
94 NEXT B
95 PRINT
96 PRINT "NO SUCH CATEGORY--TY
97 PE AGAIN."
98 PRINT
99 GOTO 400
100 PRINT L$(B); TAB 16; H$(B); TAB
101 F$(B)
102 PRINT "AMT.:"
103 INPUT E$
104 PRINT "FOR ACCT.:"
105 INPUT U$
106 PRINT U$
107 IF U$="X" THEN LET X=X+E$
108 IF U$="S" THEN LET S=S+E$
109 IF U$="V" THEN LET V=V+E$
110 IF U$="C" THEN LET C=C+E$
111 IF U$="CD" THEN LET CD=CD+E$
112 IF U$="ST" THEN LET ST=ST+E$

```

```

475 IF U$="MA" THEN LET MA=MA+E$
476 LET H$(B)=H$(B)+E$
477 LET HT=HT+E$
478 LET F$(B)=F$(B)+E$
479 LET FT=FT+E$
480 PRINT F$
481 PRINT "TO DATE"; TAB 16; H$(B)
482 TAB 24; F$(B)
483 PRINT F$
484 PRINT "TOTAL INCOME"; TAB 16
485 HT; TAB 24; FT
486 PRINT S$
487 GOTO 400
488 REM *EXPENSE STATEMENT*
489 REM AFTER ENTERING EXPENSE
490 CATEGORIES, DELETE 519, 522, 523, 5
491 24, 525, 526, 527, 528, 531, 532, 533
492 PRINT TAB 11; "EXPENSES"
493 PRINT TAB 11; "EXPENSES"
494 PRINT T$
495 LET D$="MONTH"
496 PRINT "ITEM"; TAB 16; D$; TAB
497 25; "YEAR"
498 DIM I$(17, 15)
499 DIM H$(17)
500 DIM T$(17)
501 LET MT=0
502 LET TT=0
503 LET PPT=0
504 LET PPX=0
505 PRINT S$
506 FOR N=1 TO 17
507 INPUT I$(N)
508 INPUT H$(N)
509 INPUT T$(N)
510 PRINT I$(N); TAB 16; H$(N); TAB
511 24; T$(N)
512 NEXT N
513 PRINT F$
514 PRINT "TOTAL"; TAB 16; MT; TAB
515 24; TT
516 PRINT T$
517 PRINT "TYPE ""1"" TO MAKE E
518 NTRIES, ""2"" TO RETURN TO START."
519
520 INPUT U
521 IF U<>1 THEN GOTO 5
522 REM *EXPENSE ENTRIES*
523 PRINT "IS THIS A NEW MONTH?"
524
525 INPUT Y$
526 IF Y$="NO" THEN GOTO 599
527 IF Y$="YES" THEN LET PPT=0
528 PRINT "TYPE MONTH-3 LETTER
529 ABBREVIATION"
530 INPUT D$
531 FOR D=1 TO 17 STEP 1
532 LET HT=0
533 LET N=D
534 LET H$(D)=0
535 NEXT D
536 CLS
537 PRINT TAB 8; "EXPENSE ENTRIE
538 S"
539 PRINT S$
540 PRINT "TO END ENTRIES TYPE
541 RETURN"
542 PRINT T$
543 PRINT TAB 15; D$; TAB 25; "YEA
544 R"
545 PRINT S$
546 PRINT "ITEM:"

```

Money Management, continued

```

610 INPUT C$
615 IF C$="RETURN" THEN GOTO 5
620 LET J=LEN C$
630 DIM X$(17,J)
640 FOR N=1 TO 17
650 LET X$(N)=I$(N)
660 IF C$=X$(N) THEN GOTO 700
670 NEXT N
680 PRINT "NO SUCH CATEGORY--TY
PE AGAIN."
690 GOTO 605
700 PRINT I$(N);TAB 16;M(N);TAB
24;T(N)
705 PRINT "AMT.:";
710 INPUT K
715 PRINT "FROM ACCT.:";
720 INPUT O$
725 IF O$="X" THEN LET X=X-K
730 IF O$="S" THEN LET S=S-K
735 IF O$="U" THEN LET U=U-K
740 IF O$="C" THEN LET C=C-K
745 LET M(N)=M(N)+K
750 LET T(N)=T(N)+K
755 LET TT=TT+K
760 PRINT F$
765 PRINT "TO DATE";TAB 16;M(N)
;TAB 24;T(N)
770 PRINT F$
775 PRINT "TOTAL EXPENSE";TAB 1
6;MT;TAB 24;TT
780 PRINT S$
785 GOTO 605
800 REM #ASSETS/LIABILITIES#
810 REM THESE ARE INITIALLY ENT
ERED WITH LET STATEMENTS.
820 PRINT "TAB 4;"
827 PRINT TAB 4;"ASSETS AND LI
ABILITIES;"
830 PRINT
835 PRINT S$
840 PRINT TAB 3;"CHECKING BAL."
;TAB 20;X
845 PRINT TAB 3;"VISA BAL.;"TAB
20;U
850 PRINT TAB 3;"SAVINGS BAL.;"
TAB 20;S
855 PRINT TAB 3;"CASH BAL.;"TAB
20;C
860 PRINT TAB 3;"CERTS. OF DEP.
;"TAB 20;CO
865 PRINT TAB 3;"STOCKS";TAB 20
;ST
870 PRINT TAB 3;"MISC. ASSETS";
TAB 20;MA
875 PRINT TAB 3;"PROPERTY";TAB
20;PR
880 PRINT TAB 3;"ASSETS";TAB
20;X+U+S+C+CD+ST+MA+PR
885 PRINT S$
890 PRINT TAB 3;"MORTGAGE";TAB
20;MG
895 PRINT TAB 3;"INS. LOAN";TAB
20;L
900 PRINT TAB 3;"LIABILITIES"
TAB 20;MG+L
905 PRINT S$
910 PRINT TAB 3;"NET WORTH";T
AB 20;(X+U+S+C+CD+ST+MA+PR)-(MG+
L)
915 PRINT S$
920 PRINT "ENTER ""C"" TO RETUR
N TO START."
925 STOP
930 GOTO 5
935 REM #EXIT PROGRAM INCLUDING
SAVES#
1000 PRINT "YOU HAVE INDICATED
YOU WISH TO EXIT THIS PROGRAM."
1005 PRINT
1010 PRINT "IF YOU HAVE MADE ANY
CHANGES"
1015 PRINT
1020 PRINT
1025 PRINT "DO NOT FORGET TO RE
LOAD TAPE!"
1030 PRINT
1040 PRINT
1050 PRINT "TO SAVE THIS PROGRAM
AS CHANGED PREPARE THE TAPE REC
ORDER, BEGIN RECORDING, AND TYPE
""C""."
1055 STOP
1060 SAVE "MONEY MANAGER"
1065 GOTO 5
1070 STOP
1075 REM #2-YR EXPENSE GRAPH#
1080 REM AFTER RUNNING 1700, DEL
ETE 1700, 1720, 1740
1085 REM #ENTERED MONTHLY EXPE
NSES ARE ENTERED WITH LET STATEM
ENTS A(1) TO R(23) (EVERY ALTERNAT
E NUMBER)
1700 DIM R(24)
1720 FOR I=1 TO 20
1740 PRINT I;" "
1800 CLS
1805 PRINT AT 8,0;S$
1810 PRINT "IT WILL TAKE A COUP
LE MINUTES TO PREPARE GRAPH...7
MAKE A BREAK."
1815 PRINT T$
1820 PAUSE 200
1825 IF D$="JAN" THEN LET G=2
1830 IF D$="FEB" THEN LET G=4
1835 IF D$="MAR" THEN LET G=6
1840 IF D$="APR" THEN LET G=8
1845 IF D$="MAY" THEN LET G=10
1850 IF D$="JUN" THEN LET G=12
1855 IF D$="JUL" THEN LET G=14
1860 IF D$="AUG" THEN LET G=16
1865 IF D$="SEP" THEN LET G=18
1870 IF D$="OCT" THEN LET G=20
2055 IF D$="NOV" THEN LET G=22
2060 IF D$="DEC" THEN LET G=24
2065 FAST
2070 LET O=MT
2075 LET R(G)=G
2080 CLS
2085 FOR I=15 TO 0 STEP -1
2090 PRINT AT ABS I-15,I(5);I*2
FOR U=1 TO 24
2095 IF NOT R(U) THEN GOTO 2600
2100 LET Y=R(U)+I*200
2105 IF Y<25 THEN PRINT " "
2110 IF U=1 THEN GOTO 2585
2115 IF U=3 THEN GOTO 2585
2120 IF U=5 THEN GOTO 2585
2125 IF U=7 THEN GOTO 2585
2130 IF U=9 THEN GOTO 2585
2135 IF U=11 THEN GOTO 2585
2140 IF U=13 THEN GOTO 2585
2145 IF U=15 THEN GOTO 2585
2150 IF U=17 THEN GOTO 2585
2155 IF U=19 THEN GOTO 2585
2160 IF U=21 THEN GOTO 2585
2165 IF U=23 THEN GOTO 2585
2170 IF Y>26 AND Y<25 THEN PR
2175
2180 IF Y>24 THEN PRINT " ";
2185 NEXT U
2190 IF Y>26 AND Y<25 THEN PR
2195
2200 IF Y>24 THEN PRINT " ";
2205 NEXT U
2210 PRINT
2215 NEXT I
2220 PRINT AT 16,0;"J F M A M J
J A S O N D"
2230 PRINT AT 17,0;"62 J F M A
J A S O N D"
2235 PRINT AT 19,7;"EXPENSE 19
N TO S"
2240 PRINT AT 21,6;"TYPE ""C""
TO RETURN"
2245 STOP
2250 GOTO 5
2255 CLS
2260 REM #BUDGET#
2265 REM AFTER ENTERING BUDGET,
DELETE 3100, 3105, 3120, 3135
2270 PRINT TAB 12;" "
2275 PRINT TAB 12;"BUDGET"
2280 PRINT T$
2285 PRINT "EXPENSES";TAB 16;"TO
DATE";TAB 25;"BUDGET"
2290 PRINT S$
2300 DIM P(17)
2310 FOR BT=0
2315 PRINT I$(N);TAB 16;T(N);
2320 INPUT P(N)
2325 PRINT TAB 25;P(N)
2330 LET BT=BT+P(N)
2335 NEXT N
2340 PRINT F$
2345 PRINT "TOTALS";TAB 16;TT;TA
B 25;BT
2350 PRINT T$
2355 PRINT
2360 PRINT "ENTER ""C"" TO RETUR
N TO START."
2365 STOP
2370 GOTO 5
2375 REM #INCOME/EXPENSE GRAPH#
2380 REM DELETE 3600, 3610, 3620 A
FTER RUNNING 3600
2385 DIM U(24)
2390 FOR I=1 TO 20
2395 PRINT I;" "
2400 CLS
2405 PRINT AT 6,0;S$
2410 PRINT "IT WILL TAKE A MINUT
E OR TWO TO PREPARE GRAPH.....S
H HAVE A CUP OF COFFEE."
2415 PRINT T$
2420 PAUSE 200
2425 IF M$="JAN" THEN LET D=2
2430 IF M$="FEB" THEN LET D=4
2435 IF M$="MAR" THEN LET D=6
2440 IF M$="APR" THEN LET D=8
2445 IF M$="MAY" THEN LET D=10
2450 IF M$="JUN" THEN LET D=12
2455 IF M$="JUL" THEN LET D=14
2460 IF M$="AUG" THEN LET D=16
2465 IF M$="SEP" THEN LET D=18
2470 IF M$="OCT" THEN LET D=20
2475 IF M$="NOV" THEN LET D=22
2480 IF M$="DEC" THEN LET D=24
2485 FAST
2490 LET O=MT
2495 LET Z=HT
2500 LET U(D-1)=Z
2505 GOSUB 4500
2510 LET U(D)=0
2515 CLS
2520 FOR I=15 TO 0 STEP -1
2525 PRINT AT ABS I-15,I(5);I*2
FOR U=1 TO 24
2530 IF NOT U(U) THEN GOTO 4600
2535 LET Y=U(U)+I*200
2540 IF Y<25 THEN PRINT " "
2545 IF U=1 THEN GOTO 4585
2550 IF U=3 THEN GOTO 4585
2555 IF U=5 THEN GOTO 4585
2560 IF U=7 THEN GOTO 4585
2565 IF U=9 THEN GOTO 4585
2570 IF U=11 THEN GOTO 4585
2575 IF U=13 THEN GOTO 4585
2580 IF U=15 THEN GOTO 4585
2585 IF U=17 THEN GOTO 4585
2590 IF U=19 THEN GOTO 4585
2595 IF U=21 THEN GOTO 4585
2600 IF U=23 THEN GOTO 4585
2605 IF Y>26 AND Y<25 THEN PRIN
T " "
2610 IF Y>24 THEN PRINT " ";
2615 NEXT U
2620 IF Y>26 AND Y<25 THEN PRIN
T " "
2625 IF Y>24 THEN PRINT " ";
2630 NEXT U
2635 PRINT
2640 PRINT AT 16,2;" "
2645 PRINT AT 17,2;" J F M A M J
J A S O N D"
2650 PRINT AT 19,5;"INCOME AND E
XPENSE 1982"
2655 PRINT AT 21,6;"(TYPE ""C""
TO RETURN)"
2660 RETURN
2665 CLS
2670 REM #CASH FLOW STATEMENT#
2675 PRINT TAB 10;" "
2680 PRINT TAB 10;"CASH FLOW"
2685 PRINT
2690 PRINT T$
2695 PRINT TAB 16;H$;TAB 25;"YEA
R"
2700 PRINT S$
2705 PRINT
2710 PRINT "INCOME";TAB 16;HT;T
AB 24;F$
2715 PRINT "EXPENSE";TAB 16;MT;
TAB 24;TT
2720 PRINT "LOAN PRIN. PD.;"TAB
16;PPT;TAB 24;PPX
2725 PRINT
2730 PRINT F$
2735 PRINT
2740 PRINT "NET";TAB 16;HT-MT-P
PT;TAB 24;INT ((FT-TT-PPX)*100+.
5)/100
2745 PRINT T$
2750 PRINT
2755 PRINT "TYPE ""C"" TO RETU
RN TO START."
2760 STOP
2765 GOTO 5
2770 CLS
2775 REM #LOAN REPAYMENTS AND TR
ANSFERS BETWEEN ACCOUNTS#
2780 PRINT "WHICH CATEGORY DO YOU
U WANT? ENTER ""1"" OR ""2"""
2785 PRINT
2790 PRINT "1) PRINCIPAL PAYMENT
ON LOANS"
2795 PRINT
2800 PRINT "2) TRANSFERS BETWEEN
ACCOUNTS"
2805 INPUT CA
2810 IF CA<>1 THEN GOTO 7000
2815 CLS
2820 PRINT "WHICH LOAN ARE YOU P
AYING ON? ENTER ""1"" OR ""2"""
2825 PRINT
2830 PRINT TAB 5;"1) MORTGAGE"
2835 PRINT
2840 PRINT TAB 5;"2) INSURANCE LO
AN"
2845 INPUT Z0
2850 CLS
2855 IF Z0=2 THEN GOTO 6625
2860 PRINT T$
2865 PRINT "MORTGAGE:"
2870 PRINT S$
2875 GOTO 6630
2880 PRINT T$
2885 PRINT "INSURANCE LOAN:"
2890 PRINT S$
2895 PRINT
2900 PRINT "DO NOT INCLUDE INTE
REST HERE - IT SHOULD BE ENTERED
WITH CUR- RENT EXPENSES."
2905 PRINT
2910 PRINT "PRINCIPAL PAYMENT ="
2915
2920 INPUT PP
2925 LET PPT=PPT+PP
2930 LET PPX=PPX+PP
2935 PRINT "PP"
2940 PRINT "PAID FROM WHICH ACCO
UNT?"
2945 INPUT Y$
2950 PRINT Y$
2955 IF Z0=2 THEN LET L=L-PP
2960 IF Z0=1 THEN LET MG=MG-PP
2965 IF Y$="X" THEN LET X=X-PP
2970 IF Y$="S" THEN LET S=S-PP
2975 IF Y$="U" THEN LET U=U-PP
2980 PRINT
2985 PRINT T$
2990 IF Z0=1 THEN PRINT "NEW MOR
TGAGE BALANCE: $";MG
2995 IF Z0=2 THEN PRINT "NEW INS
URANCE BALANCE: $";L
3000 PRINT S$
3005 PRINT "TYPE ""1"" IF YOU WI
SH TO TRANSFER BETWEEN ACCOUNTS,
""2"" TO RETURN TO START, ""3""
TO ENTER ANOTHER LOAN PAYMENT,
""4"" TO SEE ACCOUNT BALANCES."
3010 INPUT KK
3015 CLS
3020 IF KK=2 THEN GOTO 5
3030 IF KK=3 THEN GOTO 6602
3040 IF KK=4 THEN GOTO 800
3045 CLS
3050 PRINT S$
3055 PRINT "AMT. YOU WISH TO TRA
NSFER: $";
3060 INPUT UE
3065 PRINT UE
3070 PRINT
3075 PRINT "FROM WHICH ACCOUNT?"
3080
3085 INPUT U$
3090 PRINT U$
3095 PRINT
3100 PRINT "TO WHICH ACCOUNT? ";
3105 INPUT U$
3110 PRINT U$
3115 IF U$="S" THEN LET S=S-UE
3120 IF U$="HA" THEN LET HA=HA-U
E

```

```

7120 IF U$="U" THEN LET U=U-UE
7130 IF U$="X" THEN LET X=X-UE
7140 IF U$="CD" THEN LET CD=CD-U
7150 IF U$="ST" THEN LET ST=ST-U
7160 IF U$="C" THEN LET C=C-UE
7170 IF U$="S" THEN LET S=S-UE
7180 IF U$="HA" THEN LET HA=HA-U
7190 IF U$="U" THEN LET U=U+UE
7200 IF U$="X" THEN LET X=X+UE
7210 IF U$="CD" THEN LET CD=CD+U
7220 IF U$="ST" THEN LET ST=ST+U
7230 IF U$="C" THEN LET C=C+UE
7235 PRINT T$
7240 PRINT
7250 PRINT "TYPE '1' IF YOU WISH TO MAKE ANOTHER TRANSFER, '2' IF YOU WISH TO RETURN TO START, '3' TO SEE REVISED ACCOUNTS."
7260 INPUT JE
7265 CLS
7270 IF JE=1 THEN GOTO 7000
7275 IF JE=3 THEN GOTO 800
7290 GOTO 5
7500 CLS
7505 REM *MONTH BY MONTH INCOME, EXPENSE, DIFFERENCE, AND MEANS*
7510 PRINT T$
7520 PRINT "MONTHLY INCOME AND EXPENSE"
7530 PRINT S$
7540 PRINT T$
7550 PRINT "MONTH":TAB 7;"INCOME":TAB 14;"EXPENSE":TAB 22;"DIFFERENCE"
7560 PRINT S$
7570 LET H$="JANFEBMARAPRMAJUNJULAUGSEPOCTNOVDEC"
7571 LET HH=0
7572 LET II=0
7573 LET EE=0
7575 LET MO=3
7576 LET MM=1
7580 FOR B=1 TO 23 STEP 2
7585 LET U(B)=INT (U(B)+.5)
7586 LET U(B+1)=INT (U(B+1)+.5)
7600 PRINT H$(MM TO MO);TAB 8;U(B);TAB 15;U(B+1);TAB 23;U(B)-U(B+1)
7605 LET II=II+U(B)
7606 LET EE=EE+U(B+1)
7610 LET MO=MO+3
7620 LET MM=MM+3
7625 IF U(B)>0 THEN LET HH=HH+1
7630 NEXT B
7640 PRINT F$
7650 PRINT "TOTALS":TAB 8;II;TAB 15;EE;TAB 23;II-EE
7660 PRINT T$
7670 PRINT "ENTER 'C' TO INCLUDE MORTGAGE."
7680 STOP
7690 CLS
7700 PRINT T$
7710 PRINT TAB 7;"INCOME":TAB 14;"EXPENSE":TAB 22;"DIFFERENCE"
7720 PRINT S$
7725 PRINT
7730 PRINT TAB 8;II;TAB 15;EE;TAB 23;II-EE
7735 PRINT F$
7740 LET PP=INT (MGX-MG)
7750 PRINT "PRIN.":TAB 0;"PMTS.":TAB 15;PP
7760 PRINT F$
7770 PRINT "YEAR":TAB 8;II;TAB 15;EE+PP;TAB 23;II-EE-PP
7780 PRINT
7790 PRINT S$
7791 LET BB=0
7792 FOR B=1 TO 24 STEP 2
7793 LET AA=R(B)
7794 LET BB=BB+AA
7795 NEXT B
7800 PRINT "MEAN MONTHLY INCOME: $";INT ((II/HH)*10**2+.5)/10
7810 PRINT "MEAN MONTHLY EXPENSE: $";INT ((EE/HH)*10**2+.5)/10
7815 PRINT "MEAN EXPENSE LAST YEAR: $";INT ((BB/12)*10**2+.5)/10
7820 PRINT "(*EXCLUDING MORTGAGE)"
7830 PRINT "ENTER 'C' TO RETURN TO START."
7840 STOP
7850 GOTO 5

```

Ed.—For the convenience of our readers the author will supply the program on cassette for \$8 including postage. Readers outside the U.S. should include in the payment enough to cover the additional cost of postage for about 2 ounces. ■

Line Notes:

7: S
11: S
15: Inverse: MONEY MANAGER
70: Letter O
210: Once you have entered your income categories, delete statements indicated in REM.
223: A
225: S, B
230: Z
255: Your income categories
464: IF, LET statements credit the income to the proper account.
486: Prints a running total of both monthly and year-to-date income.
505: Once you have entered your expense categories, delete statements indicated in REM.
512: A
515: S, B
518: Z
722: IF, LET statements debit the appropriate account.
810: Initialize each asset and liability balance with LET statements.
827: S, B
828: Z
865: Change titles of assets and liabilities to suit your own needs.
875: Inverse > on M
893: Inverse > on M
896: Inverse spaces; > on M
1020: A
1025: S, B
1030: Z
1695: These 3 statements set

up your graph but should be deleted after running. R(1) would be Jan. expenses last year; R(3) Feb., etc. These will only appear on the graph when you enter each month this year, but they will be in memory waiting.
2575: A
2580: Inverse space
2588: A
2620: 81 represents last year (change to suit your needs); space between each letter representing a month; 82 represents this year.
3006: Delete statements in REM after entering all your budget items.
3010: A
3015: S, B
3020: Z
3590: Delete statements indicated in REM after running
3600:
4065: Letter O
4080: Letter O
4570: S
4575: A
4580: B
4585: D
4588: A
5030: Space between each letter.
6010: A
6020: S, B
6608: Change loan titles to suit your own needs.
7520: A (2), A (2)

Checkbook Management

George J. Repicky



A computer with its TV display, makes the task of updating and balancing a checkbook simpler than using a four-function calculator. The display enables the user to double-check entries and so helps eliminate mistakes. In addition, if mistakes are made, they are easily corrected. Below are two programs which I developed for these purposes. Each requires the 8K ROM, and each fits into 1K RAM.

Program 1

If you are like most people, you make a number of transactions—write checks, make deposits, etc.—with your checkbook before you update the balance. The first of the two programs is designed to update your checkbook balance. To use the program, enter it into the computer, then RUN.

The program first asks you to
INPUT BALANCE

At this point you enter your last computed balance.

Then the program asks you to
INPUT CHECK CHARGE

In response, you enter the per check charge of your account. (If your checking account has no check charge, you can delete lines 220 and 230, and the "-C" of line 380, from the program.)

The program then clears the screen, and displays:

INPUT CODE, THEN INPUT AMT.

ITEM DEBIT CREDIT BALANCE

At this point you enter each transaction in your checkbook in two steps. First, for each transaction you enter a code: 0 if the transaction was a debit (a monthly service charge, for example); 1 if the transaction was a credit (a deposit, perhaps); or the check number if the transaction was a check. Second, you enter the amount of the transaction. After each complete entry the computer displays the nature of the transaction in the first column,

using DEB if the transaction was a debit, CRED if the transaction was a credit, or the check number if the transaction was a check; the amount of the transaction in the second (if the transaction was a debit or check) or third (if the transaction was a credit) column; and the resulting balance in the fourth column.

For an example of how this works, suppose that your most recent balance was \$110.10 and that your account charges you \$0.25 per check. Upon entering these figures, the display would show

INPUT CODE, THEN INPUT AMT.
ITEM DEBIT CREDIT BALANCE
110.1

Now suppose your next four transactions were check 215 for \$50.; a \$3.00 monthly service charge; a \$240 deposit; and check 216 for \$245.20. To enter these you would enter 215, then 50; 0 (for a debit), then 3; 1 (for a credit), then 240; and 216, then \$245.20. The display would now show:

INPUT CODE, THEN INPUT AMT.

ITEM	DEBIT	CREDIT	BALANCE
			110.1
215	50		59.85
DEB	3		56.85
CRED		240	296.85
216	245.20		51.4

This display scrolls up with each entry, so you may continue until you have entered all transactions. The screen can hold eleven transactions at one time, so be sure you check your work from time to time. If you should detect an error, it can be offset using the 0 or 1 code, and then the amount, to adjust the balance appropriately.

Program 2

The second program is used to check your checkbook balance against your bank statement. When you run the program, it first asks you to

INPUT CHECK CHARGE

In response, you enter your account per-check

charge. If your account does not have a check charge, you can delete lines 80, 90, and 100, and the "-A" of line 190. Alternatively, if you will use the program for accounts with the same check charge, you can make line 80:

80A = (check charge) and delete lines 90 and 100.

The program then asks you to
INPUT BANK BALANCE

In response, you enter your balance as per your bank statement.

The program then asks you to
INPUT OUTSTANDING CHECKS
IF FINISHED, INPUT 0

You now enter, one at a time, the amount of each check which was not returned with the statement. As you enter the amount of each check, it is displayed on the screen. When you have entered all such checks, enter 0.

This sends the program on to the next step which asks you to

INPUT UNRETURNED DEPOSITS
IF FINISHED INPUT 0

Now you enter, one at a time, the amount of each deposit which you made since the statement was compiled by the bank, that is, the amount of each deposit which does not appear on the statement. As you enter the amount of each such deposit, its value will appear on the screen. When you are finished, enter 0. The computer will now compute your correct checkbook balance (assuming the bank has not made a mistake!) and display
CHECKBOOK BALANCE SHOULD BE:
(balance)

Memory Saving

In entering the program, you should use keywords and tokens wherever possible in the PRINT statements. This saves considerable memory and is necessary if the program is to run in 1K RAM.

To use this procedure (from Richard McDaniel, SYNC 1:5) enter the line number, then enter the last keyword in the statement. Then back up the cursor, using the left arrow

(shift 5) until it is before the keyword. Now enter the next-to-last keyword. Repeat this procedure until all keywords are entered. You can enter intermediate text as you work, or after all keywords are entered.

An example may help here. Consider line 260 from the first program:
260 PRINT "INPUT CODE, THEN INPUT AMT."

To enter this line, first type:
260 INPUT AMT."
using the keyword INPUT (on the "I" key).

Program 1. Checkbook Update.

```
200 PRINT " INPUT BALANCE"
210 INPUT B
220 PRINT " INPUT CHECK CHARGE"
230 INPUT C
240 CLS
250 SCROLL
260 PRINT " INPUT CODE , THEN I
INPUT AMT."
270 GOSUB 2000
280 PRINT "ITEM";TAB 5;"DEBIT";
TAB 13;"CREDIT";TAB 21;"BALANCE"
290 GOSUB 2000
300 PRINT TAB 21;B
310 GOSUB 2000
320 INPUT Y
330 INPUT Z
340 IF Y=1 THEN GOTO 1000
350 LET B=B-Z
360 IF Y>1 THEN PRINT Y;
370 IF Y=0 THEN PRINT "DEB";
380 IF Y>1 THEN LET B=B-C
390 PRINT TAB 5;Z;TAB 21;B
400 GOTO 310
410 LET B=B+Z
420 PRINT "CRED";TAB 12;Z;TAB 2
17;B
1020 GOTO 310
2000 SCROLL
2010 PRINT
2020 SCROLL
2030 RETURN
```

Line notes:

210: Enters the previous checkbook balance.
230: Enters the per check charge.
280: Sets the headings of the transaction listing.

300: Prints previous balance in col. 4.
320: Enters code -0, 1, or check no.
340: Enters amount of transaction.
350: Branch if transaction was a credit.
360: Decreases balance for debits.
370: Prints check no. if transaction was a check.
380: Prints DEB if transaction was a non-check debit.
390: Decreases balance by per check charge if transaction was check.
400: Prints amt. of trans. and resulting balance.
410: Returns for next transaction.
1000: Branch from 350; increases bal. for credit.
1010: Prints amt. of trans. and resulting balance.
1020: Returns for next transaction.
2000: Scroll and space subroutine; used after each line of display is printed.
2030 RETURN

To err is human . . .

BUT TO REALLY FOUL THINGS UP
YOU NEED A COMPUTER

Then back up using the left arrow (shift 5) until the cursor is before the word INPUT. Now enter THEN, using the token (shift 3). The display will read:

260 THEN INPUT AMT."

Back up again until the cursor is before THEN, and enter CODE, using the token. To do this you must first obtain the function cursor (shift NEWLINE or shift ENTER), then enter the token CODE, (on the "I" key). The display will now read:

260 CODE THEN INPUT AMT."

The cursor is now after the word CODE, so now is a good time to enter the comma. Next, back up again until the cursor is before the word CODE, and enter INPUT, again using the keyword (on the I key). The display now reads:

260 INPUT CODE, THEN INPUT AMT."

Finally, back up again until the cursor is before the word INPUT, and enter PRINT, using the keyword (on the "P" key). At this time also enter the leading quotation mark. The display will now show the complete line, ready to enter:

260 PRINT "INPUT CODE, THEN INPUT AMT."

The whole thing sounds a bit complicated when you read it, but it is really quite simple once you get the hang of it. The memory saving is substantial; 17 bytes for this one statement alone.

Program 2. Checkbook Statement Comparison.

```
70 GOSUB 2000
80 PRINT " INPUT CHECK CHARGE"
90 INPUT A
100 GOSUB 2000
110 PRINT " INPUT BANK BALANCE"
120 INPUT B
130 GOSUB 2000
140 PRINT " INPUT OUTSTANDING C
HECKS"
150 GOSUB 2000
160 GOSUB 4000
170 INPUT C
180 IF C=0 THEN GOTO 230
190 LET B=B-C-A
200 PRINT C
210 GOSUB 2000
220 GOTO 170
230 GOSUB 2000
240 PRINT " INPUT UNRETURNED DE
POSITS"
250 GOSUB 2000
260 GOSUB 4000
270 INPUT D
280 IF D=0 THEN GOTO 340
290 LET B=B+D
300 PRINT D
310 GOSUB 2000
320 GOTO 270
330 GOSUB 2000
340 PRINT "BALANCE SHOULD BE: "
B
1999 STOP
2000 SCROLL
2010 PRINT
2020 SCROLL
2030 RETURN
4000 PRINT "IF FINISHED INPUT 0"
4010 GOSUB 2000
4020 RETURN
```

Line notes:

90: Inputs per check charge
120: Inputs bank balance as per statement.
170-230: Form a loop which inputs outstanding checks and adjusts the bank statement balance for them and associated per check charges.
240-330: Adjust the bank statement balance for any deposits made after the statement was prepared.
340: Prints checkbook balance.
2000: Subroutine used to scroll and space printout.
4000: Subroutine to print statement.

Keeping Time in the Home Office

Chuck Dawson

Since the Sinclair computers have an internal timing feature, they can be used to make a clock display which will give you the time. Two basic programs are given below to do just that.

A Digital Clock

The first program provides you with a digital clock. The display will show the time in digits about three inches high and extending all across the screen.

Lines 130 and 140 control the timing. Line 130 counts the number of frames sent to the television since the last PAUSE and then holds until a specified number is reached. The PAUSE in the next line is used to fine tune things and also reset the frame counter for the next minute's cycle.

If your computer is capable of SLOW mode, you will see a display which stays rock steady until a minute passes and the last digit slowly changes itself into the next appropriate number. In the SLOW mode it does not always take exactly the same amount of time to update the display. I have noticed that, if the memory is nearly full, the computer seems to take longer to compute.

In the FAST mode, this trick will not work since no frames are sent during the compute cycle. So change line 130 to a PAUSE 3288 and line 140 to POKE 16437,255. The large numbers themselves are generated by PEEKing into the ROM's own character generating routine and enlarging it eight times. For faster updating, only the middle six lines are used. There are blank lines above and below each character so there is no reason to waste time reproducing these.

After you have typed in the program, use GOTO 700 to SAVE. The program will then run itself.

Listing 1. Digital Clock.

```

10 REM "DIGITAL CLOCK" TO SAVE
GOTO 700
15 PRINT " INPUT TIME"
20 INPUT TIME
25 CLS
30 LET H=INT (TIME/100) *60+TIM
E-INT (TIME/100) *100
35 GOTO 140
40 LET T=0
50 LET D=INT ((INT (H/60))/10)
55 GOSUB 500
60 LET T=7
65 LET D=(INT (H/60))-10*D
70 GOSUB 500
75 PLOT 31,20
82 PLOT 31,27
85 LET T=16
90 LET D=INT (60*(H/60-INT (H/
60))/10+.05)
95 GOSUB 500
100 LET T=23
110 LET D=H-INT (H/10) *10
120 GOSUB 500
130 IF PEEK 16437<>245 THEN GOT
O 130
140 PAUSE 1248
150 LET H=H+1
160 IF H=1440 THEN LET H=0
170 GOTO 40
180 LET N=7905+D*5
190 PRINT AT 7,T;
200 FOR M=N TO N+5
215 LET X=PEEK N
220 FOR L=1 TO 7
225 LET C=0
230 IF X(128 THEN GOTO 560
240 LET C=128
250 LET X=X-128
260 LET X=X*2
270 PRINT CHR$ C;
280 NEXT L
290 PRINT TAB T;
300 NEXT M
310 RETURN
320 SAVE "DIGITAL CLOCK"
330 RUN

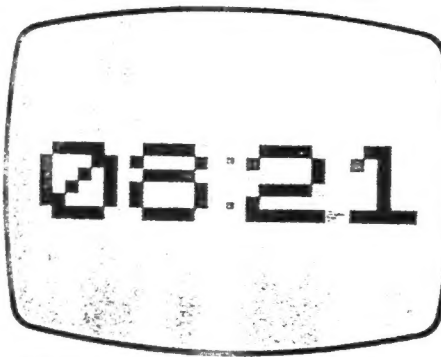
```

```

160 IF H=780 THEN LET H=60
302 IF T=0 AND D=0 THEN LET N=7
381

```

Program 1. Digital Clock.



The Face Clock

The second program will give a display with the traditional face clock. The face is drawn only once and then the hands are PLOTEd in and UNPLOTEd when no longer needed. This program is suggested by an exercise in the chapter on time and motion in the ZX81 manual.

Listing 2. Hand Clock.

```

10 REM "FACE CLOCK" TO SAVE GO
TO 500
12 PRINT " INPUT TIME"
14 INPUT T
16 LET H=2*INT (T/100)
18 LET T=T-100*INT (T/100)
20 IF T>15 THEN LET H=H+1
22 IF T>45 THEN LET H=H+1
24 CLS
26 FAST
30 FOR D=1 TO 12
32 PRINT AT 10-10*COS (D/6*PI),
,13+10*SIN (D/6*PI);D
50 NEXT D
60 SLOW
65 POKE 16437,250
70 GOTO 150
80 LET P=0
90 LET C=X
100 LET D=Y
110 GOSUB 1000
120 LET T=T+1
130 IF T=60 THEN LET T=0
140 IF T=15 OR T=45 THEN GOTO 2
50
150 LET P=1
160 LET L=T/30*PI
170 LET X=27+18*SIN L
180 LET Y=22+18*COS L
190 LET C=X
200 LET D=Y
210 GOSUB 1000
220 GOSUB 310
230 IF PEEK 16437>241 THEN GOTO
230
240 PAUSE 219
250 GOTO 80
260 LET H=H+1
270 GOTO 24
310 LET P=1
320 LET A=27
330 LET B=22
340 LET G=H/12*PI
350 LET C=27+12*SIN G
360 LET D=22+12*COS G
370 GOSUB 1000
380 RETURN
500 SAVE "FACE CLOCK"
510 RUN
1000 LET A=27
1002 LET B=22
1004 LET U=C-A
1010 LET V=D-B
1020 LET O=SGN U
1030 LET L=SGN V
1040 LET Z=SGN U
1050 LET Q=0
1060 LET M=ABS U
1070 LET N=ABS V
1080 IF M>N THEN GOTO 1130
1090 LET Z=0
1100 LET O=SGN U
1110 LET M=ABS U
1120 LET N=ABS V
1140 LET S=INT (M/2)
1150 FOR I=0 TO M
1160 IF P=1 THEN PLOT A,B
1165 IF P=0 THEN UNPLOT A,B
1180 LET S=S+N
1190 IF S<M THEN GOTO 1230
1190 LET S=S-M
1200 LET A=A+O
1210 LET B=B+L
1220 GOTO 1250
1230 LET A=A+Z
1240 LET B=B+Q
1250 NEXT I
1260 RETURN

```

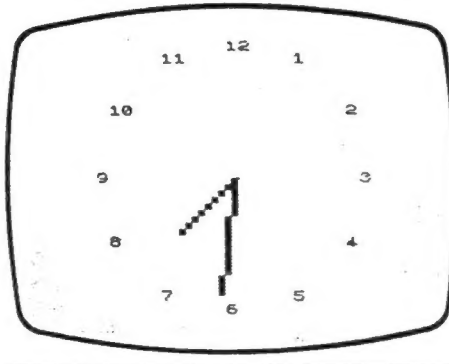
If you have only 2K RAM, you will find that this program fills up almost all available space. If you have a 16K module, you can add the second hand and other decorative touches.

After you have typed in the program, use GOTO 500 to SAVE. The program will then run itself.

Setting Your Clock

In both programs, after the program is running, you are asked to input the time. Do not use a colon; just enter the figures: Not 3:45 but 345.

Program 2. Face Clock.



A Calendar

From time to time we want to see how a certain month falls in the calendar or what day of the week a certain date is on. Most calendars show only one year on either side of the calendar year. Thus dates beyond the printed calendar have to be calculated laboriously by hand with the danger that we may have overlooked a day in an irregular month. This program provides the solution to the problem.

With this program you can enter any month and any year, and the computer will show you the calendar for that month. Well, not exactly any year. It has to be between September 14, 1752, and February 28, 2200. Nevertheless that range covers most dates of interest.

After you have typed in the program, use GOTO 300 to SAVE. The program will then run itself. The prompts will call for inputting the month and year. Type in at least the first three letters of the month and hit ENTER; then type in the year and hit ENTER. The computer will then display the calendar for that month. You can use either FAST or SLOW mode but remember that it takes much longer to produce the calendar in the SLOW mode.

To test whether the program is working right, try DECEMBER 1941. We remember that the 7th was on a Sunday. Now try some other dates. Try your birth month and year. I use this program to plan business trips and vacations for the coming year even before I start getting those free calendars in the mail in December.

This is a good program for showing off your computer to your friends. Try it at your next party.

Program 3. Calendar.

JANUARY 1983						
SUN	MON	TUE	WED	THU	FRI	SAT
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

FEB 5000						
SUN	MON	TUE	WED	THU	FRI	SAT
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29				

FEB 999999						
SUN	MON	TUE	WED	THU	FRI	SAT
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28					

Listing 3. Calendar.

```

5 REM "CALENDAR" TO SAVE GOTO
300
10 LET A$="CDJANFEBMARAPR MAYJU
N JULAUGSEP OCTNOVDECSUN MON TUE W
ED THU FRI SAT"
15 PRINT "INPUT MONTH"
20 INPUT B$
25 FOR M=1 TO 12
30 IF B$(1 TO 3)=A$(3*M TO 3*M
+2) THEN GOTO 45
35 NEXT M
40 GOTO 20
45 PRINT "INPUT YEAR"
50 INPUT Y
55 IF Y<1752 THEN GOTO 50
60 CLS
65 PRINT AT 3,8;B$;" "Y
70 PRINT AT 6,0;A$(39 TO )
75 GOSUB 200
80 PRINT AT 8,Z*4;
85 LET M=M+1
90 GOSUB 200
95 IF Z=0 THEN LET Z=7
100 FOR I=1 TO 31
110 PRINT " ";I;" ";
120 IF I<10 THEN PRINT " ";
130 IF I>27 AND 33-PEEK 16441=Z
*4 THEN STOP
140 IF PEEK 16441=5 THEN PRINT
150 NEXT I
200 LET X=0
210 IF M=1 OR M=2 THEN LET X=1
220 LET L=Y-X
230 LET X=M+X*12
240 LET P=INT (L/100)
250 LET Z=INT (13*(X+1)/5)+INT
(S/L/4)+INT (P/4)-P
260 LET Z=Z-7*INT (Z/7)
270 RETURN
300 SAVE "CALENDAR"
310 RUN

```